STATE OF ALASKA DOT&PF

MATERIAL SITE INVENTORY STATUS & INSPECTION REPORTS

CENTRAL REGION

JONESVILLE & BUFFALO MINE / MOOSE CREEK ROADS

SECONDARY ROUTE NO. 585

FEDERAL PROJECT NO. STP-000S(530)
AKSAS PROJECT NO. 76174

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March, 2011

STATEWIDE MATERIAL SITE INVENTORY

LIMITATIONS

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STATEWIDE MATERIAL SITE INVENTORY

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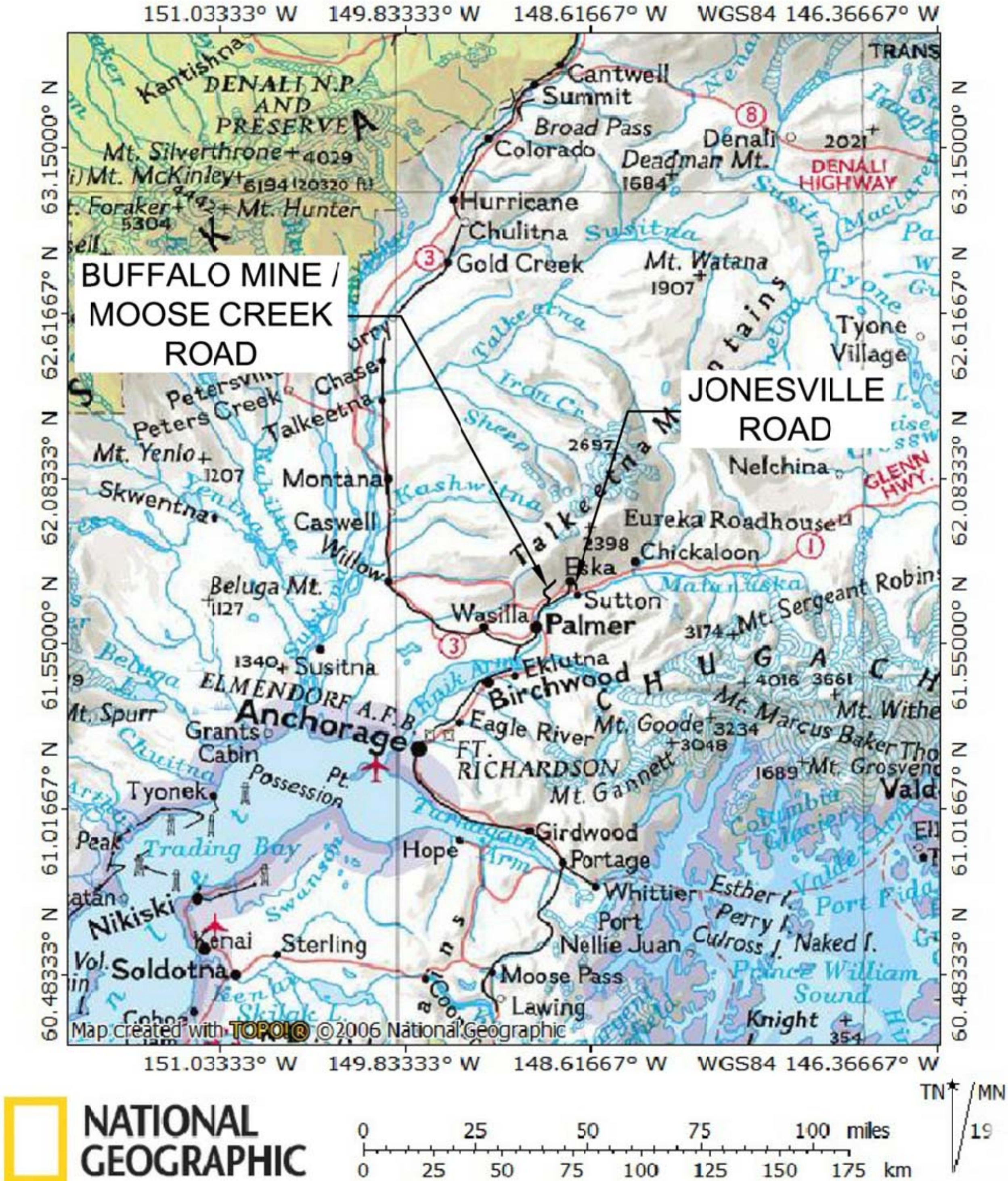
JONESVILLE & BUFFALO MINE / MOOSE CREEK ROADS
SECONDARY ROUTE NO. 585

TABLE OF CONTENTS

LIST OF APPENDICES

JONESVILLE & BUFFALO MINE / MOOSE CREEK ROADS

VICINITY MAP



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1.0 MATERIAL SITE NUMBERING

Alaska Department of Transportation and Public Facilities (DOT&PF) material site numbers for Jonesville and Buffalo Mine / Moose Creek Roads were assigned using the following format.

Using secondary route system coding, i.e. 585-001-1:

- The first three digits represent the Secondary Federal Aid Route Number, for the Jonesville Road this number is 585.
- The 4th, 5th and 6th digits are the assigned site number.
- The last digit is the region in which the site is located. For Central Region the number is 1.

2.0 GEOLOGIC SETTING

The following information is general in nature and is intended to provide those who are unfamiliar with the area with a general description of the geology, and how it relates to material sites. This information is not intended to be complete. More detailed investigations should be performed before decisions are made on individual material sites.

2.1 Location and History

The inventory area lies along the Glenn Highway corridor between Milepost (MP) 52 at Buffalo Mine / Moose Creek Road and MP 63 at Granite Creek. The area includes the following local roads:

- Buffalo Mine / Moose Creek Road from MP 53 on the Glenn Highway (6.5 miles in length)
- Jonesville Mine Road North MP 61 (1.7 miles in length)
- Jonesville Strip Mine Road from MP 1.7 of Jonesville Mine Road (2.7 miles in length)
- Other local roads (19.5 miles in length)

Jonesville Road begins in the community of Sutton and then proceeds north to the closed Jonesville Coal Mine. Sutton is at MP 61 of the Glenn Highway, 11 miles northeast of Palmer in the

Matanuska-Susitna Borough. Sutton was founded around 1918 as a station on the Matanuska Branch of the Alaska Railroad. The post office was established in 1948. Buffalo Mine/Moose Creek Road connects the Glenn Highway with the community of Buffalo/Soapstone. The community is directly north of Palmer and Farm Loop, west of the Glenn Highway. It lies west of Moose Creek and Buffalo Creek. The sites of Baxter Mine, Buffalo Mine, Matanuska Sinner Mine, and Premier Mine are located in the area. The Palmer Correctional Center is located north of MP 58 along the Glenn Highway, between the two roads.

2.2 General Geology

The surficial geology in this area is dominated by glacial processes which created glacial till and glaciofluvial deposits. The area is bisected by the Tsadaka Canyon (Moose Creek). The Jonesville and Buffalo Mine / Moose Creek Roads area lies on glaciofluvial deposits approximately 300 feet above the Matanuska River floodplain. The glaciofluvial deposits are primarily esker and kame deposits that form a hummocky surface. There is a flatter glaciofluvial outwash plain near the Palmer Correctional Facility and another location near Sutton. Wishbone Hill borders the north side of these hills. Much of the land in this area is privately owned but there are several large parcels of State land.

The glaciofluvial materials range from sand to coarse gravel and may contain large boulders. The only aggregate testing results found for this material in DOT&PF Material Site files were from a site (MS 42-2-335-1) along the Glenn Highway. L.A. Abrasion losses for this site ranged from 14 to 17 and degradation values from 49 to 61. Thus, it appears that construction aggregates may be produced from at least some material in this area.

The bench on which the glaciofluvial deposits lie consists of Tertiary bedrock of the Chickaloon, Wishbone, and the Tsadaka Formations, which also underlie Wishbone Hill to the north. These formations consist of conglomerate, sandstone, siltstone and claystone. These rocks are generally soft to medium hard and typically not suitable for riprap or aggregate production. There are no DOT&PF sites in these bedrock units.

The area is generally free of permafrost except where isolated patches of permafrost occur in lowland areas where ground insulation is high, such as peat bogs and swamps. Groundwater along this portion of the alignment is generally associated with poorly drained low lying areas or with streams.

3.0 LAND USE PLANNING

State lands along the Jonesville and Buffalo Mine / Moose Creek Roads and surrounding area are being managed by the State of Alaska Department of Natural Resources (DNR) under the Susitna Area Plan. DNR is presently in the process of separating the Susitna Area Plan into the Susitna Matanuska Plan (in planning phase) and the Southeast Susitna Area Plan (adopted 2008). Lands along the Jonesville and Buffalo Mine / Moose Creek Roads are covered by the Susitna Area Plan and will be included in the Susitna Matanuska Area Plan when adopted. DNR is also preparing a management plan for the Nelchina Public Use Area, which may include portions of this area.

The Susitna Area Plan was adopted in 1985 and amended in 1993. It includes most of the Matanuska Susitna Borough with the exception of the area included in the Southeast Susitna Area Plan.

The complete plan and information about the new plan revisions are available on the internet at the following address:

http://dnr.alaska.gov/mlw/planning/areaplans/susitna/index.cfm

The introduction to the Susitna Area Plan states that “Overall, this plan strives for development of resources on state and borough lands while emphasizing protection of environmental quality and community character. The plan proposes expanded use of the area's resources, but controls the manner and location of development so that many of the qualities that make the area attractive are protected and enhanced.”

The section on Materials found in Chapter 2: Subsurface Resources and Materials, reads as follows.

“7. MATERIALS GUIDELINES

A. Preferred Material Sites. When responding to a request for a material sale or identifying a source for materials, the highest priority should be given to using existing upland material sources. Using materials from wetlands, lakes and the active[1] or inactive[2] floodplain of rivers or streams should be avoided unless no feasible alternative exists. Sales or permits for gravel extraction will not be permitted in fish spawning beds.

[1] **Active floodplain —** the portion of the floodplain that is flooded frequently; it contains flowing channels, highwater channels, and adjacent bars, usually containing little or no vegetation.

[2] **Inactive floodplain —** the portion of the floodplain that is flooded infrequently; it may contain high-water and abandoned channels and is usually lightly to heavily vegetated.

B. Material Extraction from Sensitive Areas. Material extraction from wetlands, lakes, or stream corridors (including the active and inactive floodplain) should occur only after design consultation with ADF&G, DOT/PF, DPOR, DGGS and ADEC.

If the only feasible and prudent source of gravel is an active or inactive floodplain of a stream or river, the following guidelines[3] will be used, in addition to the design consultation required above, to minimize negative impacts of material extraction on other resources and uses.

1. Stream types should be selected for material extraction based on the following order of preference (most to least preferable): braided, split, meandering, sinuous, and straight. This order of preference reflects the availability of gravel from exposed bars: the largest volumes are available from braided systems and the least from straight systems. An additional factor is the decreasing floodplain width of the stream types identified above. Wider floodplains allow extraction further from the river channel itself, reducing environmental impacts.

2. Generally the largest river feasible should be selected for a gravel operation in a given area. Larger rivers have higher volumes of gravel and wider floodplain. The proportionally smaller disturbance in large river systems will reduce the overall effect of gravel removal.

3. Mining gravel from active channels should be avoided to reduce detrimental effects on water quality, aquatic habitat, and biota. However, if hydraulic changes can be minimized, in-channel sites will replenish more rapidly than other areas and effects on the terrestrial biota and scenic quality of the floodplain will be avoided or greatly minimized.

   Before gravel is extracted from the active floodplain or channel of a stream or river DGGS should be consulted to ensure that the planned operation does not exceed the annual rate of gravel deposition and cause upstream erosion. It is particularly important for DGGS to establish the rate of deposition in rivers or streams when large quantities of gravel will be taken from the active floodplain or channel over long periods of time.

4. Whenever possible, avoid vegetated habitats.

5. When scraping gravel in active or inactive floodplains, maintain buffers that will contain active channels to their original locations and configurations.

6. When small quantities of gravel are required (approximately 50,000 m^3), select sites that have only unvegetated gravel deposits.

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[3] These guidelines are adopted from: "Gravel Removal Studies in Arctic and Subarctic Floodplains in Alaska," U.S.F.W.S., Biological Services Program, June 1980. More detailed guidelines are continued in the "Guidelines Manual" that accompanies that report.

7. When large quantities of gravel are required (approximately in excess of 50,000 m^3), select large rivers containing sufficient gravel in unvegetated areas, or select terrace locations on the inactive side of the floodplain and mine by pit excavation.

8. If pit excavating is used, design a configuration with high shore line and water depth diversity and provide islands.

9. If mining in vegetated areas, save all overburden and vegetative slash and debris to use during site rehabilitation to facilitate vegetative recovery. This material should be piled or broadcast in a manner so it will not be washed downstream.

C. Maintaining Other Uses And Resources When Siting and Operating Material sites. Before allowing the extraction of materials, the manager will ensure that the requirements of the permit or lease give adequate protection to other important resources and uses including, but not limited to: existing water rights; water resource quantity and quality; navigation; fish and wildlife habitat and harvest; commercial forest resources; recreation resources and opportunities; historic and archaeological resources; adjacent land uses; and access to public or private lands. The disposal of materials should be consistent with the applicable management intent statement and management guidelines of the plan. The manager should also determine if other existing material sites can be vacated and rehabilitated as a result of opening a new material site.

D. Screening and Rehabilitation: Material sites should be screened from roads, residential areas, recreational areas and other areas of significant human use. Sufficient land should be allocated to the material site to allow for such screening. Where appropriate, rehabilitation of material sites will be required. For additional guidelines affecting material extraction see policies under the section of subsurface resources."

4.0 RELEVENT PUBLICATIONS

The following is a list of publications that may be useful for understanding the geology and material sources in the Buffalo / Soapstone – Sutton area. (Note: references pertaining specifically to the Anchorage Quadrangle appear under the quadrangle listing; references including the Anchorage Quadrangle plus other areas appear in the "alignment-wide" section).

Anchorage Quadrangle C-5, C-6, D-5 and D-6

Alaska Division of Geological and Geophysical Surveys (DGGS), 1983, Guidebook to Permafrost and Quaternary Geology along the Richardson and Glenn Highways between Fairbanks and Anchorage, Alaska, T.L. Péwé and R.D. Reger (Eds.), Guidebook 1, State of Alaska, Department of Natural Resources.

Barnes, F.F., 1962, Geologic Map of Lower Matanuska Valley, Alaska, U.S. Geological Survey Misc. Geological Investigation Map I-359, scale 1:63,360.

Barnes, F.F., and Payne, T.G., 1956, The Wishbone Hill District, Matanuska Coal Field, Alaska, U.S. Geological Survey Bulletin 1016, 88 pp.

Reger, R.D., Updike, R.G., 1983. Physiographic map and field-trip locations on the Upper Cook Inlet area, Alaska. In: Pe'we', T.L., Reger R.D. (Eds.), Guidebook to Permafrost and Quaternary Geology along the Richardson and Glenn Highways Between Fairbanks and Anchorage, Alaska. : Fourth International Conference on Permafrost. American Geophysical Union.

R&M Consultants, Inc., 1981, Geological and geotechnical investigations, Glenn Highway Realignment Study, Palmer to Mile 135, Phase 1, Task 1.2.8, Second Edition, Prepared for Alaska Department of Transportation and Public Facilities.

R&M Consultants, Inc., 2005. Glennallen to Palmer spur line soil studies. Prepared for Alaska Department of Revenue, Alaska Natural Gas Development Authority, 2 Vol.

Trainer, F.W., 1955, Surficial geology of an area adjoining the edge of the Matanuska Valley, Alaska: U.S. Geological Survey Open-File Report 55-182, 7 p.

Winkler, G.R., 1992. Geologic map and summary geochronology of the Anchorage 1 º x 3 º quadrangle, southern Alaska: Miscellaneous Investigations Series Map I-2283, 1 sheet, scale 1:250,000. USGS.

Alignment-wide

Brown, J., Ferrians, O. J., Heginbottom, J. A., and Melnikov, E. S., 1997, Circum-Arctic map of permafrost and ground-ice conditions: U.S. Geological Survey Circum-Pacific Map, 1map, scale 1:10,000,000.

Coulter, H. W., Hopkins, D. M., Karlstrom, T. N. V., Péwé, T. L., Wahrhaftig, C., and Williams, J. R., 1965, Map showing extent of glaciations in Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-415, 1 map, scale 1:2,500,000.

Ferrians Jr., O.J., Schmoll, H.R., 1957, Extensive proglacial lake of Wisconsin age in the Copper River Basin, Alaska. Geol. Soc. Am. Bull. 68 (12, Part 2), 1726.

Ferrians, O. J. (comp.), 1965, Permafrost map of Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-445, 1 map, scale 1:2,500,000.

Gallant, A. L., Binnian, E. F., Omernik, J. M., and Shasby, M. B., 1995, Ecoregions of Alaska: U.S. Geological Survey Professional Paper Report Number 1567, 73 p. 1 map, scale1:5,000,000.

Jones, D.L., Silberling, N. J., Berg, H. C., and Packer, G., 1981, Map showing tectonostratigraphic terranes of Alaska, columnar sections, and summary description of terranes: U.S. Geological Survey Open File Report 81-792, 21 p., 1 sheet.

Karlstrom, T.N.V., et al., 1964, Surficial geology of Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-357, scale 1:584,000.

Péwé, T.L., 1975, Quaternary geology of Alaska: U.S. Geological Survey Professional Paper 835, 145 p., 3 plates.

Reger, R.D., Combellick, R.A., Brigham-Grette, J., 1995, Late-Wisconsin events in the Upper Cook Inlet region, Southcentral Alaska. In: Combellick, R.A., Tannian, F. (Eds.), Short Notes on Alaska Geology 1995: Professional Report 117. Alaska Division of Geological & Geophysical Surveys, pp. 33-45.

Schmoll, H.,R., Yehle, L.,A., Gardner, C., A., Odum, J.,O.,1984, Guide to Surficial Geology and Glacial Stratigraphy in the Upper Cook Inlet Basin. Alaska Geological Society, p. 89.

Wiedmer, M., Montgomery, D.R., Gillespie, A.R., Greenberg, H., 2010, Late Quaternary megafloods from Glacial Lake Atna, Southcentral Alaska, U.S.A., Quaternary Research 73 (2010) 413-424.